Evaluation and comparison of sanitation control in primary production with different milking technology

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Investigations were carried out concerning the testing of commercial and classical disinfectants and cleaning agents used in primary milk production. The testing of disinfectants was performed under laboratory and operation conditions.

The results obtained during the testing of the disinfectants as well as the results obtained in critical points refer to the suitability of their application under operation conditions.

The paper describes some relationships between milk CPM (total plate count of microorganisms) and additive hygienic qualitative traits and specified effective methods of special advisory service related to nonstandard values of CPM and coliform microbes (additive microbiologic characteristics).

In Slovak Republic extensive monitoring of coliform bacteria frequency (upper threshold value 1 000 CFU/ml) is used as a complementary hygienic trait of milk. In EU countries this control is used only selectively in cheese production sphere.

The following complementary hygienic parameters are controlled according to the Slovak standard No. 57 0529 :

- count of psychrotrophic microorganisms (<50 ths. CFU/ml);
- count of thermoresistant (heat-resistant) microorganisms (<2 ths. CFU/ml);
- spore – forming anaerobic bacteria (negative in 0.1 ml milk).

Relations CPM – total count of psychrotrophic elements (CPP) were studied in RIAP Nitra. According to local investigations approx. 96 % delivered in Slovak Republic comply with the standardized level of psychrotrophic microorganismus. Significant CPM-CPP correlations (0.61 – 0.96) were determined in three sets of bulk milk samples. Relatively high correlations demonstrate adequate efficiency of CPM as a hygienic parameter included in fresh milk CPM control (marketability parameter).

Preliminary estimates of distribution rates (CPM and psychrotrophic elements) had been made in a less standard set (longer sample transport). These estimates were precised later and relative CPP proportion in CPM was established in three standard sets. Calculatin utilizing the weighted mean of the mentioned values (24 %) indicate that the standard limits for CPM £ 100 ths. and £ 50 ths. CFU/ml can correspond to CPP£ 24 ths. and £ 12 ths CFU/ml. The metioned facts substantiate non-acceptance of the proposed revision of CPP limit (£5 ths. CFU/ml) as a complementary qualitative parameter included in the Slovak standard No. 57 0529. As for confrontation of relative frequencies (29 % >24 %), longer transport periods and longer storage – analysis intervals characterizing the firstly mentioned sample demostrate increasing proportion of psychrotrophic elements from milkint to milk processing. Therefore, milk sampling in the terminal phase of the transport line as well as longer milking – sampling intervals impair some producers (not even effective cooling procedure does stop increase of pychrotrophic elements).

Relatively close relationship between mean microbiologic quality of milk and its variability (i.e. technologic repeatability) – 0.5 – 0.7 – was envisaged. Much more close relationship (r = 0,94) was found in case of 6 analyses at minimum realized ones during 3 – 6 months in most cases, but also in 12 month – period.

Consulting activity is aimed at hygienic problems associated with coliform microorganisms incidence. Prompt and efficient solution of problems was conditioned by milk sampling (phase samples and other additive ones) for specification of the objective principal causes of problems :

- cleaning and sanitation regimes included in the mentioned „economical modification“ were classified as inadequate ones;
- they did not prevent trace incrustation in receiver units (collectors) of milking apparatuses. Incrustation was detectable only by touch after dismounting of the apparatus; simple visual control was ineffective. Besides of this principal defect a circular adipose sediment of waxy character (removable with difficulty) was found in milkmeters;
- efficient and repeated manual cleaning of all receiver units and milkmeters with acidic cleaning agent was followed by a circuit acid cleaning (1 % nitric acid) for 20 min (inlet temperature 75°C; outlet temperature 45°C). The sanitary regimen was modified according to the standards declared by the International Dairy Federation.

The following principles guarantee success of advisory service:

- proper complex analysis of the actual situation, its objectivization, specification of effective acceptable and realizable measures,
- responsible approach of the personal staff management board and service staff to realization of the proposed corrective measures and intervations will (process itself will result from the professional educational activity).